The atom mastery answers

1. Charge, positive, negative, neutral, positive, negative, positive, neutral, charge, atom, model
2. Experimental evidence
3. D has no smaller parts, PP has (protons, neutrons, electrons)
D has no charge, PP has charged particles
4. PP: spread out positive charge, N: concentrated in nucleus
PP electrons studded in, N: electrons orbit nucleus
PP no protons or neutrons, N: protons and neutrons
5. Ball of spread out positive charge, negative electrons studded in
6. Alpha particles fired at a one atom thick piece of gold. Atoms expected to pass straight through but were deflected and bounced back.
7. That the atoms must have their positive charge concentrated in a nucleus, not spread out like in the plum pudding model
8. Proton
9. Empty space
10. -1
11. The nucleus does not have electrons
12. Nucleus with protons and neutrons
13. +1
14. Experimental evidence
15. Atom, protons, neutrons, electrons, substance, element, periodic table, elements, sodium
16. Worked example
17. 9
18. PP: spread out positive charge, N: concentrated in nucleus
PP electrons studded in, N: electrons orbit nucleus
PP no protons or neutrons, N: protons and neutrons
19. 12
20. 22
21. 42
22. 6
23. Same as the atomic number
24. 20.19
25. 6.92
26. 55.91
27. 28.11
	1. 200.64
	2. It has been rounded up
	3. 26
	4. 42
	5. 43
	6. 78
	7. 19
	8. 17
	9. 2
	10. 54
28. In shells orbiting the nucleus
29. PP: studded in, NM: orbiting in shells



Elements, compounds and structure

1. Compound
2. Element
3. Element has same atoms, compound same
4. Chemical bonds, number of atoms
5. Protons, neutrons, electrons
6. See page 1
7. Experimental evidence
8. Atoms of the same element with different numbers of neutrons
	1. False
	2. True
	3. True
	4. False
	5. False
9. B
	1. Don’t have to be different
	2. Can be an elment
	3. Doesn’t have to be same type
	4. Needs a chemical bond
10. 2,8,1 and 2,7
11. By bonding atoms of fluorine
12. Compound
13. Contains different elements chemically bonded
14. Molecular substances, molecules, chemically bonded, chemical formula
15. Two hydrogen atoms, two oxygen atoms, two nitrogen atoms, two hydrogen and one oxygen atom, four hydrogen and one carbon atoms, two oxygen and one carbon
16. Hydrogen, oxygen, nitrogen elements, water, methane and carbon dioxide compounds
17. Methane, water, hydrogen, oxygen, carbon dioxide
18. 10
19. 20
20. 6
21. 1,1,0
22. Giant substances, atoms, chemically bonded, giant substances, elements, compounds
23. Left is element, right is compound
24. Left has only one type of atom, right has two types of atom
25. Because they have hundreds of atoms bonded together
26. Fe
27. P: 26, E: 26, N: 30
28. 47.32

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| Atoms are made of  |  | How many atoms are in that substance and what those atoms are |
| Atoms can be joined together by |  | Molecular substance |
| When a small group of atoms are joined together we call this a  |  | Elements or compounds |
| A substance made of lots of molecules is a  |  | Giant substance |
| A substance made of billions of atoms all joined together is a |  | Molecule  |
| Molecular and giant substances can be |  | Chemical bonds |
| The chemical formula of a substance tells you |  | Protons neutrons and electrons |

1. Nitrogen + hydrogen 🡪 ammonia
2. Nitrogen and hydrogen
3. Ammonia
4. Ethanol + oxygen 🡪 carbon dioxide + water
5. Ethanol, oxygen; reactants. Carbon dioxide, water; products.
6. It is made of one type of atom
7. It is made of billions of molecules which do not have chemical bonds between them
8. 8,8,8
	1. Done
	2. One calcium two bromine
	3. 3 magnesium 2 nitrogen
	4. 6 carbon, 12 hydrogen, 6 oxygen
	5. 1 carbon, 2 oxygen
	6. 7 carbon, 5 hydrogen, 3 nitrogen, 6 oxygen
	7. 1 calcium, 2 oxygen, 2 hydrogen
	8. 2 lithium, 1 sulphur, 4 oxygen
	9. 2 aluminium, 3 sulphur, 12 oxygen
	10. 1 calcium, 1 carbon, 3 oxygen
	11. 1 magnesium, 2 nitrogen, 6 oxygen
	12. 1 gallium, 2 nitrogen, 6 oxygen
9. P and Q
10. R
11. P and Q reactants, R product
12. The atoms have rearranged into a new substance
13. 3
14. 6
15. 3
16. 6
17. As no atoms have been created or destroyed, just rearranged
18. 2Na + Cl2 🡪 2NaCl
19. 2Li + F2 🡪 2LiF
20. 2Mg + O2 🡪 2MgO
21. 2Ca + O2 🡪 2CaO
22. P4 + 5O2 🡪 2P2O5
23. 4Al + 3Cl2 🡪 2Al2Cl3
24. S + 3F2 🡪 SF6
25. 2K + 2H2O 🡪 2KOH + H2
26. S8­ + 12O2 🡪 8SO3
27. MgCO3 + Ca 🡪 CaCO3 + Mg
28. Li2SO4 + 2K 🡪 K2SO4 + 2Li
29. Mg(OH)2 + 2K 🡪 2KOH + Mg
30. CH4 + 2O2 🡪 CO2 + 2H2O
31. Copper sulphate + sodium hydroxide 🡪 copper hydroxide + sodium sulphate
32. Copper sulphate + sodium hydroxide reactants, copper hydroxide + sodium sulphate products
33. 1 copper, 1 sulphur, 4 oxygen
34. Atoms of different elements chemically bonded
35. CuSO4 + 2NaOH 🡪 Cu(OH)2 + Na2SO4
36. 1 calcium, 1 carbon, 3 oxygen
37. Compound, atoms of different elements chemically bonded
38. Giant
39. CaCO3 + 2HCl 🡪 CaCl2 + CO2 + H2O
40. Billions of atoms all chemically bonded together
41. Magnesium + oxygen (reactants) 🡪 magnesium oxide (product)
42. 2Mg + O2 🡪 2MgO
43. As above
	1. White circles (O2) and grey circles (Mg)
	2. Grey circles with white circles stuck on
	3. Oxygen, magnesium elements, magnesium oxide, compound
	4. Same number on both sides
	5. Atoms of oxygen are now being weighed as they are bonded to the magnesium. They were not included as part of the original mass as they were in the air